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Flexible nanocomposite membrane of bacterial cellulose/polyaniline

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Flexible bacterial cellulose/polyaniline (BC/PANI) nanocomposite membranes were prepared by oxidative polymerization of aniline with BC. BC is a natural nanoporous matrix and has been recently used as a template for nanocomposite membranes because of its excellent mechanical properties and stability in solvent in spite of highly porous structures. The nanoporous BC/PANI nanocomposite membranes were composed of ~100 nm diameter of nanofibers. The morphology of the BC/PANI membrane was studied by field-emission scanning electron microscopy. The presence of PANI on the BC surface was characterized by Fourier transform infrared spectroscopy and the conductivity of the BC/PANI membrane was measured by four-probe measurements. The presence of PANI significantly increased the electrical conductivity of nanocomposite membranes and the detailed effects will be illustrated in the presentation. Continuously stable mechanical property of BC/PANI nanocomposite membranes was shown after the chemical synthesis of PANI with BC template. The flexible membrane with high conductivity could be applicable for fuel cell barrier, electromagetic shielding, chemical sensors and flexible display in the future.

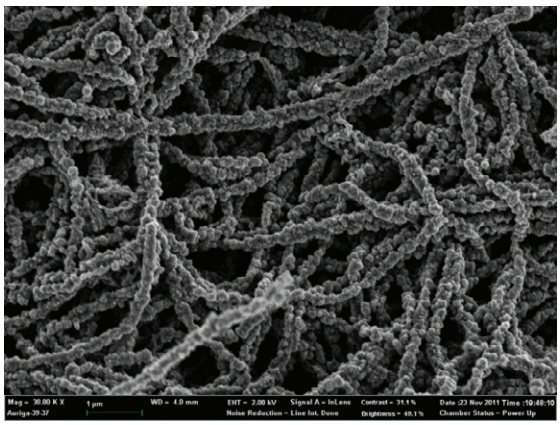

Figure 1. SEM image of the BC/PANI surface

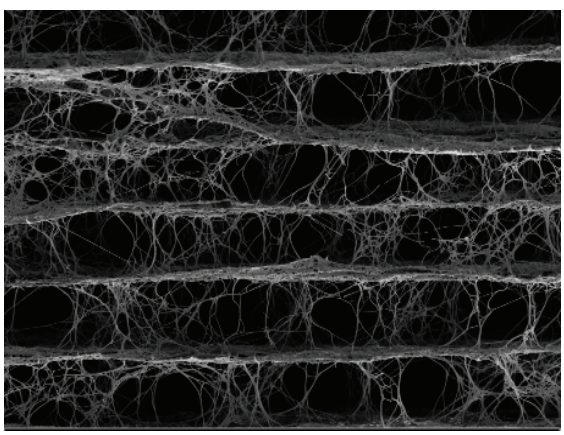

Figure 2. SEM image of the cross-section of BC

References

1. Byoung-Ho Lee, Hyun-Joog Kim, Han-Seung Yang, Current Applied Physics 12 (2012) 75-80.

2. Sungryul Yun, Jaehwan Kim, Carbon 49 (2011) 518-527.

3. Jaeyoo Choi, Subeom Park, Jie Cheng, Minsung Park, Jinho Hyun, Colloids and Surfaces B-Biointerfaces 89 (2012) 161-166.

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